Executive Summary
Solvay Soda Ash Joint Venture
Expansion No. Two

General Information

Name of Firm: Solvay Soda Ash Joint Venture

Responsible Official: Richard L. Casey - Vice President

Address of Firm: P.O. Box 1167 (#1 Westvaco Road) Green River, WY 82935

Telephone Number: (307) 872-6571

Type of Operation: Trona mine and refinerey

Plant Location: 20 West of Green River, Wyoming

Purpose of Application

Solvay Soda Ash Joint Venture is proposing to construct a fourth soda ash product line that will increase current permitted production by 50 percent or 1.2 million tons per year (TPY). This will bring permitted soda ash production to 3.6 MMTPY. The project is designed to be constructed in three phases, with soda ash production increasing in increments of 400,000 TPY for each phase. The first phase will include the installation of all equipment requiring air pollution controls.

Process Description

The primary raw material for the facility is sodium sesquicarbonate, commonly referred to as trona. Chemically, it is sodium carbonate and sodium bicarbonate, bound with two molecules of water. The chemical formula for trona is: $Na_2Co_3 \bullet NaHCO_3 \bullet 2H_2O$. Natural sodium carbonate is produced by liberating CO_2 and H_2O from the trona by heating, converting it to sodium carbonate, commonly referred to as soda ash. The chemical formula for soda ash is Na_2Co_3.

Once the trona is calcined to a crude soda ash, it is dissolved, so that the insoluble impurities can be filtered. The first step of filtration is done utilizing a series of mechanical rakes, the resultant waste insolubles are returned to the mine void. The soda ash liquor is further filtered, employing carbon and filter aid, resulting in a clear, nearly saturated solution. Crystallizers are then used to evaporate water to produce a sodium carbonate monohydrate crystal. The crystals are drawn off, centrifuged, and conveyed to a product dryer.

The dryer causes the monohydrate crystals to liberate both the molecular and free moisture, resulting in anhydrous sodium carbonate, or soda ash. The high purity product is then sized and sent to silos before shipment via rail or truck, bulk or bags.

Emission Sources

Emission sources are shown in Table I. As shown, there will be eleven new point sources including: (1) Primary Crushing Baghouse - AQD #74, (2) Primary Screening Baghouse - AQD #75, (3) Transfer Tower No. 1 Baghouse - AQD #76, (4) Transfer Tower No. 2 Baghouse - AQD #77, (5) Transfer Tower No. 3 Baghouse - AQD #78, (6) Transfer Tower No. 4 Baghouse - AQD #79, (7) Calciner Electrostatic Precipitator (ESP) - AQD #80, (8) Dryer ESP - AQD #81, (9) Dryer Area Baghouse - AQD #82, (10) Top of Silos No. 7 & 8 Baghouse - AQD #83, (11) Bottom of Silos No. 7 & 8 Baghouse - AQD #84.

Process Rates

As indicated above, this project is designed to produce and additional 1.2 MM TPY of soda ash from 2 MM TPY of trona ore. In addition, the three existing calciners will be modified, resulting in an increase in production from 162 TPH to 200 TPH each. Process rates are shown below in Table II.

Table II: Expansion and Post-Modification Process Rates

Calciners

AQD #	Ore Feed Rate (TPH)	Calcined Ore Rate (TPH)	Ore Feed @ Full Load (MMTPY)	Design Annual Ore Feed Rate (MMTPY)
17	400	292	3.504	3.154
48	200	146	1.752	1.577
80	300	219	2.628	2.365
Total	900	657	7.884	7.096

Dryer

AQD #	Wet Crystal Feed Rate (TPH)	Soda Ash Production Rate (TPH)	Soda Ash Production @ Full Load (MMTPY)	Design Annual Soda Ash Feed Rate (MMTPY)
81	113	92	0.806	0.725

It is assumed that the equipment will be available for operation 90 percent of the time.

Pollutant Emission Rates

The pollutants of concern for this project are pariculate (all stack particulate emissions are assumed to be PM_{10}), NO_X, VOC, and HAP

Type of Control Equipment

✪Criteria Pollutants
✪VOCs
NSPS
BACT
✪Criteria Pollutants
✪VOCs
Monitoring and Record Keeping
PSD
Impact on Existing Ambient Air Quality